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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/722,168	11/22/2000	Clifford Brown	21-006	3876
22898	7590	12/10/2004	EXAMINER	
THE LAW OFFICES OF MIKIO ISHIMARU 1110 SUNNYVALE-SARATOGA ROAD SUITE A1 SUNNYVALE, CA 94087			KIM, KEVIN	
			ART UNIT	PAPER NUMBER
			2634	

DATE MAILED: 12/10/2004

Please find below and/or attached an Office communication concerning this application or proceeding.

**Office Action Summary**

Application No.

09/722,168

Applicant(s)

BROWN ET AL. 

Examiner

Kevin Y Kim

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --  
Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

**Status**

- 1) ☒ Responsive to communication(s) filed on 20 November 2000.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

**Disposition of Claims**

- 4) ☒ Claim(s) 1-91 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☒ Claim(s) 33-38, 41-48, 50-53, 73, 74, 76, 77, 79 and 80 is/are allowed.
- 6) ☒ Claim(s) 1, 5-7, 9-13, 15, 20-29, 31, 32, 39, 40, 49, 54, 56-61, 63, 65-70, 72, 75, 78, 81, 83, 85, 87-90 is/are rejected.
- 7) ☒ Claim(s) 2-4, 8, 14, 16-19, 30, 55, 62, 64, 71, 82, 84, 86 and 91 is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

**Application Papers**

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 20 November 2000 is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

**Priority under 35 U.S.C. § 119**

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some \* c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
  2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
  3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

**Attachment(s)**

- |   |   |
|---|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892)   | 4) <input type="checkbox"/> Interview Summary (PTO-413)<br>Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948)                                    | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152)             |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)<br>Paper No(s)/Mail Date. _____ | 6) <input type="checkbox"/> Other: _____  |

## DETAILED ACTION

### *Claim Objections*

1. The numbering of claims is not in accordance with 37 CFR 1.126 which requires the original numbering of the claims to be preserved throughout the prosecution. When claims are canceled, the remaining claims must not be renumbered. When new claims are presented, they must be numbered consecutively beginning with the number next following the highest numbered claims previously presented (whether entered or not).

### *Claim Rejections - 35 USC § 112*

2. Claim 5,6,9,10,12,23,24,26,39,40,49,56,57,59,60,61,67,68,75 and 78 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

Claims 9,23,39,59,67 and 75 recite terms " $Z_{ave}$ ", "C" and  $Z_{exp}$ " but fails to define their meanings.

Claims 12,26,49, 61 and 78 recite terms such as " $Y_{ave}[b4]$ " but fails to define their meanings.

Claims 5 and 56 recite terms  $\sigma_x$  and  $\sigma_y$  that are not defined.

Claims 6,10,24,40,57, 60 and 68 are rejected for the same reason for their respective dependence on rejected claims.

For the purpose of examination, they are understood as described in the specification.

***Claim Rejections - 35 USC § 103***

3. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

4. Claims 1,7,11,13,20-22,25,27-29,31,54,58,65,66,69,70 and 72 are rejected under 35

U.S.C. 103(a) as being unpatentable over Kim et al (US 5,602,601) in view of Pottinger et al (US 4,918,708).

Consider claims 1 and 54. Kim et al describes "a device for detecting impairments in a digital quadrature amplitude modulated signal. See Fig.7 and last line in Abstract. The device comprises "a phase noise detector" (50) and "a constellation storage" (45) coupled to the phase noise detector. See col. 5, lines 3-61. Kim et al fails to disclose "a compression detector" and "an interference detector" that are also coupled to the constellation storage. Pottinger et al discloses a QAM impairment detector including compression and interference. See col.4, lines 48-58. Thus, it would have been obvious to one skilled in the art at the time the invention was made to further add "a compression detector" and "an interference detector" to the phase error detector of Kim et al for the purpose of compensating all the signal impairments, as suggested by Pottinger et al. Further respect to claims 78, 82,84 calling for a "memory device for storing program instructions steps," a software implementation of a hardware function is well known in the art and thus would have been obvious to program the phase, compression and interference detection of Kim et al as modified by Pottinger et al with software.

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Regarding claim 7, see section selector (41) for “a sorter” and the error computing part (50) for “an X/Y deviation determinator.” Although the error computing part (50) is disclosed in the Kim et al patent for determining phase error, a similar computing part would have been included for the compression detector because both requires the comparison of a received signal constellation (42) and the original constellation (45).

Regarding claim 11, since all the cells/sectors of the constellation are analyzed, the analysis automatically includes analyzing “a top row cells of a constellation.”

Regarding claim 13, since all the cells/sectors of the constellation are analyzed, the analysis automatically includes analyzing “a column of cells of a constellation.”

Regarding claim 20, as described above, it would have been obvious for the QAM impairment detector of Kim et al to further include “a compression detector” to compensate signal to provide impairments-free signal since “compression” is an undesirable signal impairments that has to identified as taught by Pottinger et al.

Regarding claim 21, see the error computing part (50) for “an X/Y deviation determinator.” Although the error computing part (50) is disclosed in the Kim et al patent for determining phase error, a similar computing part would have been included for the compression detector because both requires the comparison of a received signal constellation (42) and the original constellation (45).

Regarding claim 22, see section selector (41) for “a sorter” that is coupled to the X/Y deviation determiner.

Regarding claim 25, since all the cells/sectors of the constellation are analyzed, the analysis automatically includes analyzing “a top row cells of a constellation.”

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Regarding claim 27, since all the cells/sectors of the constellation are analyzed, the analysis automatically includes analyzing “a column of cells of a constellation.”

Regarding claim 28, the combination of a phase noise detector with a compression detector has been discussed in the rejection of claim 1 above.

Regarding claim 29, as described above, it would have been obvious for the QAM impairment detector of Kim et al to further include an interference detector to compensate signal to provide impairments-free signal since “interference” is an undesirable signal impairments that has to identified as taught by Pottinger et al.

Regarding claim 31, the combination of a phase noise detector with an interference detector has been discussed in the rejection of claim 1 above.

Regarding claim 58, see section selector (41) for “means for sorting” and see the error computing part (50) for “means for determining X/Y deviations.”

Regarding claim 65, as described above, it would have been obvious for the QAM impairment detector of Kim et al to further include “means for detecting compression” to compensate signal to provide impairments-free signal since “compression” is an undesirable signal impairments that has to identified as taught by Pottinger et al.

Regarding claim 66, see the error computing part (50) for “means for determining X/Y deviations.”

Regarding claim 69, a combination of a phase noise detector with a compression detector has been discussed in the rejection of claim 1 above.

Regarding claim 70, as described above, it would have been obvious for the QAM impairment detector of Kim et al to further include “means for detecting interference” to

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compensate signal to provide impairments-free signal since “interference” is an undesirable signal impairments that has to identified as taught by Pottinger et al.

Regarding claim 72, a combination of a phase noise detector with an interference detector has been discussed in the rejection of claim 1 above

***Claim Rejections - 35 USC § 102***

5. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

6. Claims 15, 32 and 63 are rejected under 35 U.S.C. 102(b) as being anticipated by Kim et al.

Consider claim 15 and 63. Kim et al describes “a device for detecting impairments in a digital quadrature amplitude modulated signal. See Fig.7 and last line in Abstract. The device comprises “a phase noise detector” (50).

Regarding claim 32, see section selector (41) for “a sorter” and see the error computing part (50) for “a comparator coupled to the sorter.”

***Claim Rejections - 35 USC § 103***

7. Claims 81,83,87-90 are rejected under 35 U.S.C. 103(a) as being unpatentable over Kim et al (US 5,602,601) in view of Pottinger et al (US 4,918,708) and Gatherer (US 6,560,294).

Consider claim 81. Kim et al describes “a device for detecting impairments in a digital quadrature amplitude modulated signal. See Fig.7 and last line in Abstract. The device

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comprises “a phase noise detector” (50) and “a constellation storage” (45) coupled to the phase noise detector. See col. 5, lines 3-61. Kim et al fails to disclose “a compression detector” and “an interference detector” that are also coupled to the constellation storage. Pottinger et al discloses a QAM impairment detector including compression and interference. See col.4, lines 48-58. Thus, it would have been obvious to one skilled in the art at the time the invention was made to further add “a compression detector” and “an interference detector” to the phase error detector of Kim et al for the purpose of compensating all the signal impairments, as suggested by Pottinger et al. Furthermore, Gatherer teaches an implementation of a phase detector with a program executed by a digital processor, which is known as allowing flexibility in design such as modification and adaptation because of programmability. See col. 15, lines 3-5. Thus, it would have been obvious to store program instructions for the impairments detection in a memory for software implementation as taught by Gatherer.

Regarding claim 83, see section selector (41) for “a sorter” and the error computing part (50) for “an X/Y deviation determinator.”

Claims 87, as described above, it would have been obvious for the QAM impairment detector of Kim et al to further include “a compression detector to compensate signal to provide impairments-free signal since “compression” is an undesirable signal impairments that has to identified as taught by Pottinger et al.

Regarding claim 88, see the error computing part (50) for “an X/Y determinator.”

Regarding claim 89, see the section selector (41) for “a sorter” coupled to the X/Y deviations.”



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Claims 90, as described above, it would have been obvious for the QAM impairment detector of Kim et al to further include “an interference detector to compensate signal to provide impairments-free signal since “interference” is an undesirable signal impairments that has to identified as taught by Pottinger et al.

8. Claim 85 is rejected under 35 U.S.C. 103(a) as being unpatentable over Kim et al (US 5,602,601) in view of Gatherer (US 6,560,294).

Kim et al describes “a device for detecting impairments in a digital quadrature amplitude modulated signal. See Fig.7 and last line in Abstract. The device comprises “a phase noise detector” (50). Kim et al fails to teach a “memory for storing program instructions” for the phase noise detector. Gatherer teaches an implementation of a phase detector with a program executed by a digital processor, which is known as allowing flexibility in design such as modification and adaptation because of programmability. See col. 15, lines 3-5. Thus, it would have been obvious to store program instructions for the impairments detection in a memory for software implementation as taught by Gatherer.

***Allowable Subject Matter***

9. Claims 2-4,8,14,16-19,30,55,62,64,71,82,84,86 and 91 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

10. Claims 33-38,41-48,50-53,73,74,76,77, 79 and 80 are allowed.

11. Claims 5,6,9,10,12,23,24,26,39,40,49,56,57,59,60,61,67,68,75 and 78 would be allowable if rewritten to overcome the rejection(s) under 35 U.S.C. 112, 2nd paragraph, set forth

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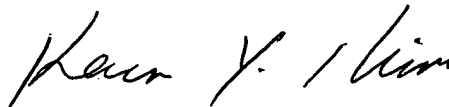
in this Office action and to include all of the limitations of the base claim and any intervening claims.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Kevin Y Kim whose telephone number is 571-272-3039. The examiner can normally be reached on 8AM --5PM M-F.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Stephen Chin can be reached on 571-272-3056. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

kvk



KEVIN KIM  
PATENT EXAMINER